

A plurality of quantum dots are distributed dispersedly on the principal surface of a substrate comprising a first semiconductor. A cover layer comprising a second semiconductor is formed on a virtual plane on which the quantum dots are distributed. A barrier layer is disposed on the virtual plane at least in an area not disposed with the quantum dots. The barrier layer comprises a third semiconductor or insulator having a band gap wider than band gaps of the first and second semiconductors. A semiconductor device is provided which can prevent an injection efficiency of carriers into quantum dots.

[illegible]